effected; so that in March 1821 the parts were fit for the performance of their natural functions.

Calculations of some Observations of the Solar Eclipse on the 7th of September, 1820. *By Mr.* Charles Rumker. *Communicated by* Thomas Young, *M.D. For. Sec. R.S.* Read May 10, 1821. [*Phil. Trans.* 1821, *p.* 311.]

These calculations are founded upon Burckhardt's lunar, and Carlini's solar tables.

An Account of the Re-measurement of the Cube, Cylinder, and Sphere, used by the late Sir George Shuckburgh Evelyn, *in his Inquiries respecting a Standard of Weights and Measures. By Captain* Henry Kater, *F.R.S.* Read June 7, 1821. [*Phil. Trans.* 1821, *p.* 316.]

The experiments above adverted to are detailed in the Philosophical Transactions for 1798; and though the greatest attention was bestowed on those parts of the inquiry relating to the *weight* of the solids, the method of *measuring* them is not so fully detailed; Captain Kater, therefore, was desirous of re-investigating the latter subject before the Commissioners of Weights and Measures should make their final report.

The author then proceeds to describe the state of the apparatus; and the means which he adopted in effecting this measurement of three sides of the cube gives for its content 124·1969 inches.

The length of the cylinder deduced from these means is =5·9960 inches.

In measuring the sphere, a brass square was originally employed, the side of which was a little longer than the diameter. The sphere being properly placed and supported within the square, a micrometer screw which passed through one of the sides of the square was brought in contact with the diameter of the sphere, and the reading of the micrometer head noted; the sphere being then removed, a brass rule of known length was put into its place, and the micrometer screw being brought in contact with the end of the rule, the difference between its length and the diameter of the sphere was obtained, from which the latter was determined. Captain Kater details at length the repetition of Sir George's measurements, where it appears that the excess of the diameter of the sphere above the length of the rule gives 0·0012281 inch. The author then proceeded to measure the brass rule, the length of which was found equal to 6·0063609 inches; and the diameter of the sphere thence deduced gave 113·5264 inches for its solid content.

Captain Kater concludes this paper with a table, showing the data furnished by Sir George Shuckburgh Evelyn's experiments and his own measurements; from which it appears that the weight of a cubic inch of distilled water, in a vacuum of 62°, = 252·888 grains of Sir George's standard, or = 252·722 grains of the parliamentary standard.